PORTIO

OF TH

OCUM

ARE

LEGI

LA-UR -81-1192

TITLE: PLOT2K - A GRAPHICS INTERFACE TO SYSTEM 2000

MASTER

AUTHOR(S): Larry R. Creel

SUBMITTED TO: VIM 34 Conference

University of California

LOS ALAMOS SCIENTIFIC LABORATORY
Post Office Box 1663 Los Alamos, New Mexico 87545
An Affirmative Action Equal Opportunity Employer

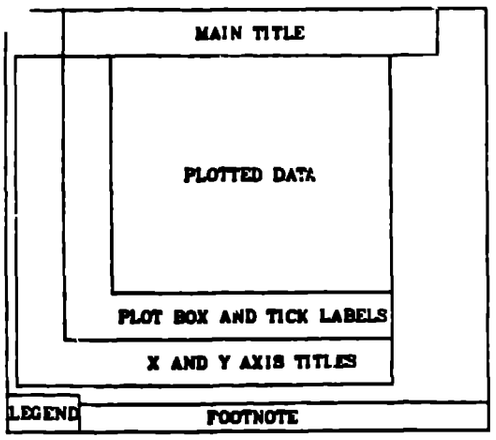

Figure 2. x-y Point Plots: Plot Regions

Pie Charts

A pie chart can contain up to 12 sections, each of which may be the same or a different color. The schema for the pie chart is given in Fig. 3. The Main Title and Footnote areas are the same as in the histogram and x-y plots. The two areas named Labels each contain slots for up to 11 labels. The pie is divided into sections with the largest section centered at -90°. A vector is drawn from each section to the label identifying the section. Labelling begins with the lower slot in the right Labels area and continues with each successive slot until the mid-point of a section exceeds 90°. At this time, labelling is picked up with the top slot in the left Labels area and continues until the last section has been labelled. Note that after the first section has been entered as the pie, the order in which subsequent sections are entered is immaterial. The size of each section is determined by what percentage of the whole it represents. PLOT2K calculates the percentage automatically.

An enhancement being considered would allow a user to specify a particular section of the pie to be removed a small distance from the whole pie for attention-getting purposes.

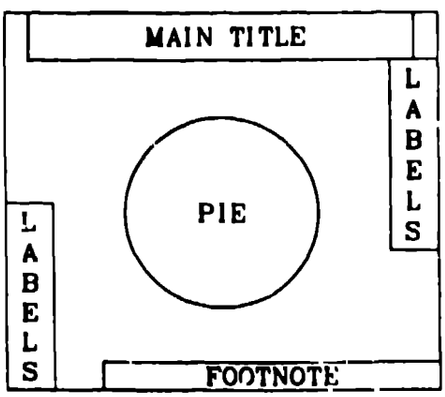

Figure 3. Pie Charts: Plot Regions

MODULES OF PLOT2K

PLOT2K is composed of six modules, for ease of modification and enhancement as well as for minimizing the amount of memory required at any one time. A procedure file containing job control statements controls the execution of each module.

1. Information Gathering Module

From the user, Module 1 interactively obtains the information PLOT2K needs about the System 2000 data base and the plot labels to generate the plot file. The data obtained is written to disk files that will be read by other modules.

2. Edit Module

Module 2 permits users to modify any existing disk files used by PLOT2K. An option available to users will allow them to skip Module 1 and go directly to Module 2, where they may modify files that were used in a previous run of PLOT2K. This option can be a real timesaver, when only the plotted data changes or only the labels change.

3. System 2000 Command Generating Module

Module 3 reads output files created by Modules 1 and 2. From the information obtained, it writes a file containing System 2000 commands to retrieve data from the data base.

4. System 2000 Interface Module

Module 4 passes the commands from the System 2000 command file written by Module 3 to System 2000. This program is listed in its entirety in Fig. 4. The one delicate area for error handling is the processing of the System 2000 commands. By using a command file, any error that occurs can be easily traced simply by examining the command file and the error file generated by System 2000.

An alternate method of tracing an error in the command file is to invoke System 2000 interactively and have it execute the command file. Any errors will be reported by System 2000; if the problem is a lack of output from System 2000, that, too, will be obvious.

```
      program prog4(instrt,tape9=instrt)
      dimension kard1(8)


   10 continue
      read (9,30) kard1
   30 format (1x,8a10)
      if (eof(9).ne.0.) go to 80
      call submit (kard1,rtncd)
      go to 10
   80 continue



      rewind 9
      stop
      end
```

Figure 4. Program Listing for Module 4

5. x-y Data Massaging Module

The output file generated by System 2000 in Module 4 consists of x and y axis values. Module 5 reads this file and writes the x and y values to separate files in a format that Module 6 expects.

6. Plot Generating Module

Module 6 reads the file generated by the previous

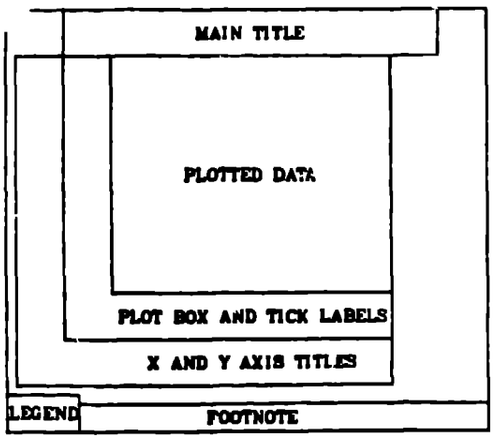

Figure 2. x-y Point Plots: Plot Regions

Pie Charts

A pie chart can contain up to 12 sections, each of which may be the same or a different color. The schema for the pie chart is given in Fig. 3. The Main Title and Footnote areas are the same as in the histogram and x-y plots. The two areas named Labels each contain slots for up to 11 labels. The pie is divided into sections with the largest section centered at -90°. A vector is drawn from each section to the label identifying the section. Labelling begins with the lower slot in the right Labels area and continues with each successive slot until the mid-point of a section exceeds 90°. At this time, labelling is picked up with the top slot in the left Labels area and continues until the last section has been labelled. Note that after the first section has been entered as the pie, the order in which subsequent sections are entered is immaterial. The size of each section is determined by what percentage of the whole it represents. PLOT2K calculates the percentage automatically.

An enhancement being considered would allow a user to specify a particular section of the pie to be removed a small distance from the whole pie for attention-getting purposes.

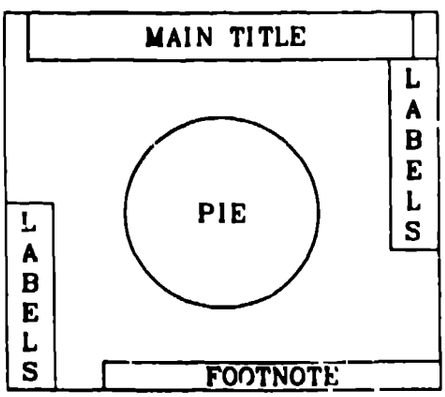

Figure 3. Pie Charts: Plot Regions

MODULES OF PLOT2K

PLOT2K is composed of six modules, for ease of modification and enhancement as well as for minimizing the amount of memory required at any one time. A procedure file containing job control statements controls the execution of each module.

1. Information Gathering Module

From the user, Module 1 interactively obtains the information PLOT2K needs about the System 2000 data base and the plot labels to generate the plot file. The data obtained is written to disk files that will be read by other modules.

2. Edit Module

Module 2 permits users to modify any existing disk files used by PLOT2K. An option available to users will allow them to skip Module 1 and go directly to Module 2, where they may modify files that were used in a previous run of PLOT2K. This option can be a real timesaver, when only the plotted data changes or only the labels change.

3. System 2000 Command Generating Module

Module 3 reads output files created by Modules 1 and 2. From the information obtained, it writes a file containing System 2000 commands to retrieve data from the data base.

4. System 2000 Interface Module

Module 4 passes the commands from the System 2000 command file written by Module 3 to System 2000. This program is listed in its entirety in Fig. 4. The one delicate area for error handling is the processing of the System 2000 commands. By using a command file, any error that occurs can be easily traced simply by examining the command file and the error file generated by System 2000.

An alternate method of tracing an error in the command file is to invoke System 2000 interactively and have it execute the command file. Any errors will be reported by System 2000; if the problem is a lack of output from System 2000, that, too, will be obvious.

```
      program prog4(instrt,tape9=instrt)
      dimension kard1(8)


   10 continue
      read (9,30) kard1
   30 format (1x,8a10)
      if (eof(9).ne.0.) go to 80
      call submit (kard1,rtncd)
      go to 10
   80 continue



      rewind 9
      stop
      end
```

Figure 4. Program Listing for Module 4

5. x-y Data Massaging Module

The output file generated by System 2000 in Module 4 consists of x and y axis values. Module 5 reads this file and writes the x and y values to separate files in a format that Module 6 expects.

6. Plot Generating Module

Module 6 reads the file generated by the previous

iodules and creates a device-independent plot file. At his time, the procedure allows the user to branch back o Module 1 or Module 2 (to create another plot) or ex- t.

ONCLUSION

PLOT2K is a versatile tool for generating graphs rom a System 2000 data base. Its chief virtue is the ase with which it can be used, modified, and developed. his makes the graphics plot accessible to a wide range f users and allows it to be altered to suit a wide ange of needs.

ACKNOWLEDGEMENTS

PLOT2K was created to satisfy the requirements for a Masters degree from the Department of Computer Science, University of New Mexico. I wish to thank Karl J. Melendez, who sponsored me in this undertaking, and R. F. Hults, who realized the need for an interface such as PLOT2K and suggested I use it for my masters project. Both men are staff members in the Computing Division at the Los Alamos National Laboratory.

APPENDIX

SAMPLE RUN OF PLOT2K

A sample run of PLOT2K is given below. This run generated the bar chart shown in Fig. A-1.

```
the following is a listing of the input file the user
is required to have in his local file space.


list,f=s2kcom
 LIST C300, C345 UH C200 EQ LASL
 AND (C300 EQ CYBER 73 OR C300 EQ CDC 6600
 OR C300 EQ VAX,4M,FPA OR C300 EQ VAX,1.5M)
 AND C100 EQ
 LABMK14;
 EOI ENCOUNTERED.
/

-s2kpi
  X  WILL PLOT FILE GO TO MICROFILM OR TEKTRONIX ? (M/T)
? m
                WELCOME TO
           SYSTEM 2000 PLOTTING

FOR THE FOLLOWING FILE NAMES INDICATE WHETHER YOU
HAVE THE FILE ALREADY (H), WANT TO CREATE THE FILE (C),
OR WANT A DESCRIPTION OF THE FILE (D)

  X  PS2KA & PS2KB  (H/C/D)
? c
  X  PS2KC          (H/C/D)
? c
  X  PS2KD          (H/C/D)
? c
  X  S2KOPT         (H/C/D)
? c
  X   DOES FILE NAMED S2KCOM EXIST AS LOCAL FILE ? (Y/N)
? y
### CREATE S2KOPT ###

  XXXXXXXXXX  DATABASE NAME ?
? benchmk
  XXXXXXXXXX  DATABASE PASSWORD ?
? kathy
  X   PLOT TYPE ? ( LINE, BAR, PIE )
? b
  X  IS X-AXIS DATA ALPHANUMERIC OR NUMERICAL ? (A/N)
? a
  X  IS Y-AXIS DATA ALPHANUMERIC OR NUMERICAL ? (A/N)
? n
  X  REPLACE S2K ORDERING COMPONENT IDENTIFIERS ? (Y/N)
? n
```

```
*** CREATE PS2KA & PS2KB ***

  (80 CHARACTERS)  TOP LINE OF TIYLE
? example plot of plt2k
  (80 CHARACTERS)  MIDDLE LINE OF TITLE
? data portrayed is rates for solving
  (80 CHARACTERS)  BOTTOM LINE OF TITLE
? an integer arithmetic monte carlo code
  (80 CHARACTERS)  FOOT NOTE
? example footnote
  (80 CHARACTERS)  X AXIS TITLE ( HORIZONTAL )
? los alamos computers
  (80 CHARACTERS)  Y AXIS TITLE ( VERTICAL )
? cpu run times in seconds
  X  WANT A SHADED FONT ?
? n
  X   BLACK & WHITE OR COLOR SLIDE ? (B/C)
? c
  X   WANT DEFAULT COLORS ? (Y/N)
? n
COLOR CHOICES (RED,GREEN,BLUE,YELLOW,MAGENTA,CYAN,WHITE,EXOTIC)
FIRST LETTER SUFFICIENT (R,G,B,Y,M,C,W,E)

  X   MAIN TITLE COLOR ?
? c
CYAN    CHOSEN.

  X   PLOTTED DATA  COLOR ?
? w
WHITE   CHOSEN.

  X   PLOT BOX AND TICK LABELS COLOR ?
? y
YELLOW  CHOSEN.

  X   AXES TITLES COLOR ?
? m
MAGENTA CHOSEN.

  X   FOOT NOTE COLOR ?
? c
CYAN    CHOSEN.

ENTERING EDIT PHASE.

  X  LOOK, MODIFY, OR END ? (L/M/E)
? e
ARE YOU FINISHED MAKING PLOTS ?
? yes
RETURN(MAPBN,EMAPN,TEKIN,TEKOUT,MCOL)
/get,mapper/un=library
/-mapper
```

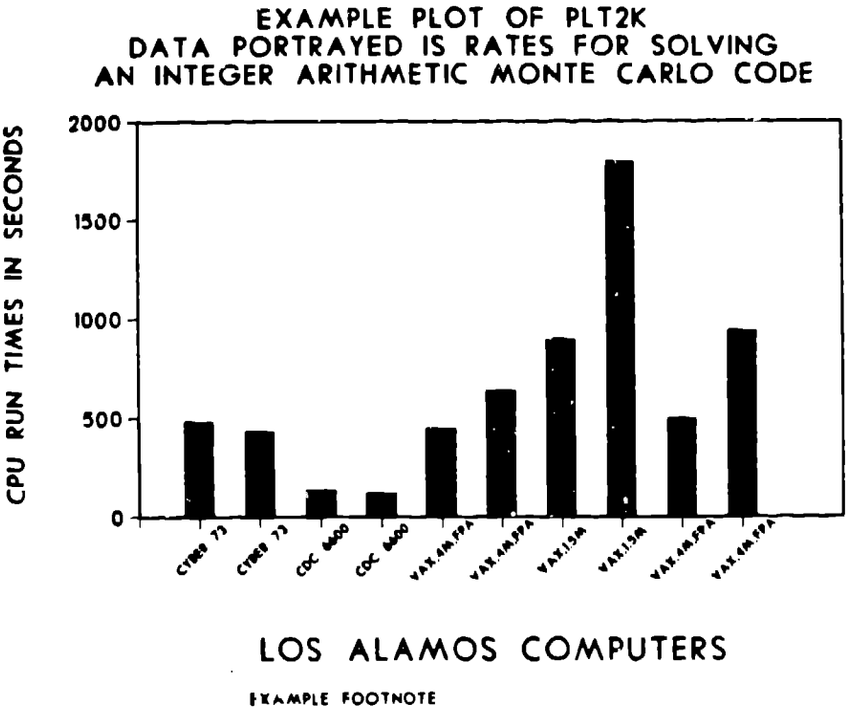

Figure A-1. Bar Chart Generated by the Sample Run

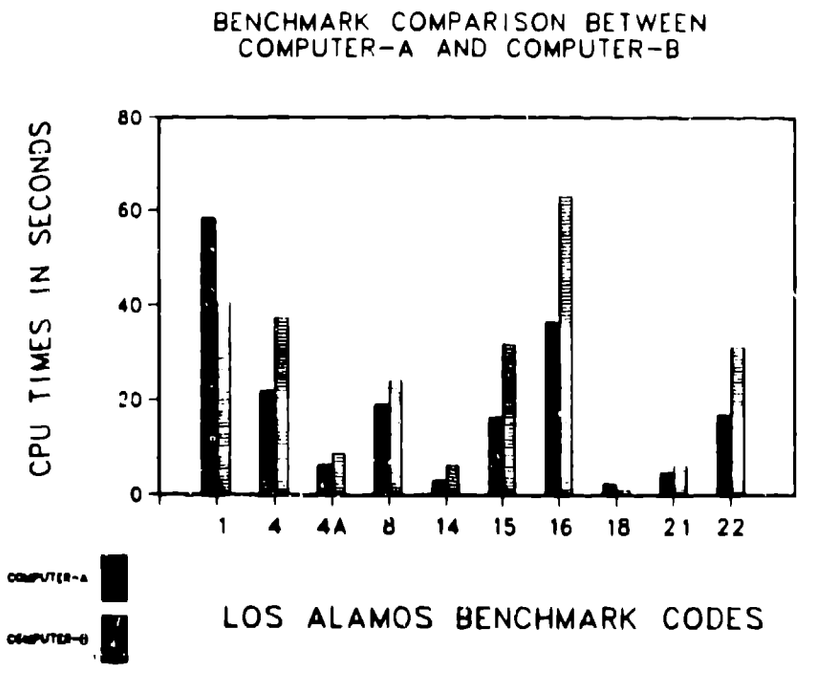

Fig. A-2. Bar Chart Using Pairs of Bars